

**REMARKS/ARGUMENTS**

Claims 1-5 are currently pending in this application. The claims have not been amended with the filing of this response.

As an initial matter, Applicant wishes to thank the Examiner for withdrawing the Election of Species requirement.

Reconsideration of the application is respectfully requested in view of the following remarks.

**Rejection under 35 U.S.C. § 112**

The rejection of claims 1-5 under 35 U.S.C. § 112, second paragraph, as indefinite, is respectfully traversed.

The Office has rejected the claims as incomplete for omitting essential steps, i.e., the steps for the actual hydrocyanation reaction. According to the Office, the omission amounts to a gap between the steps. However, in our view, the claims would clearly be understood to one of ordinary skill without additional steps.

Applicant points out, as indicated in the MPEP § 2173.02, that the essential inquiry pertaining to compliance under 35 U.S.C. § 112, second paragraph is

whether the claims set out and circumscribe a particular subject matter with a reasonable degree of clarity and particularity.

Definiteness of claim language must be analyzed, not in a vacuum, but in light of:

- (A) The content of the particular application disclosure;
- (B) The teachings of the prior art; and
- (C) The claim interpretation that would be given by one possessing the ordinary level of skill in the pertinent art at the time the invention was made.

In the present case, the claimed method clearly provides a reasonable degree of clarity and particularity in light of the specification, references of record, those having ordinary skill in the art. In particular, one would reasonably be able to understand the claimed invention without any additional steps recited for a hydrocyanation reaction. Therefore, the claimed invention is definite. Accordingly, withdrawal of the rejection is respectfully requested.

**Rejection under 35 U.S.C. § 103**

The rejection of claims 1-5 under 35 U.S.C. § 103(a) as obvious over Watson (GB-628686) in view of Arakawa et al. (US Patent No. 4,504,692) and Fischer et al. (US Patent No. 6,242,633) is respectfully traversed.

As acknowledged and appreciated by the Office, Watson does not describe hydrocyanating 1,3-butadiene over at least one nickel(0) catalyst having phosphorus ligands, in which the process provides a mixture of from 60 to 90% by volume of 1,3-butadiene and from 40 to 10% by volume of n-butane. The Office further appreciates that there is no indication of the hydrocyanating reaction or where the second dehydrogenation is done oxidatively.

According to the Office, it would be obvious to selectively modify the steps described in Watson by maximizing the yields and perform the distillation step according to Arakawa et al. and use the final product in a hydrocyanation reaction according to Fischer et al. The Office also asserts that one would be motivated to do so, in order to create a preferred automated, continuous process.

However, contrary to the Office's assertions, Applicant points out that the claimed invention (claim 1) describes a two-stage n-butane dehydrogenation, which includes a first non-oxidative n-butane dehydrogenation (claim 1 B) and a subsequent oxidative dehydrogenation (claim 1 C). This is followed by the removal of steam and low boilers to obtain a mixture of n-butane, 2-butene and 1,3-butadiene (claim 1 D) and the distillative removal of a 1,3-butadiene/ n-butane mixture (claim 1 E).

Furthermore, it is noted that the coupling of non-oxidative n-butane dehydrogenation with oxidative n-butane dehydrogenation results in a much higher yield of butadiene, based on n-butane used (see present specification, page 12, line 31 to 33). In addition, it is advantageous that the removal of a, 3-butadiene/ n-butane azeotrope or mixture as the top product of a distillation, as provided in claim 1 E) (see present specification, page 16 lines 8 to 14).

The oxidative n-butane dehydrogenation forms by-products, known as oxygenates, which do not occur in the non-oxidative dehydrogenation of n-butane. These are, for example, compounds such as furan, acetic acid, maleic anhydride, formic acid and butyraldehyde (see present specification, page 13, lines 11 to 17).

These by-product components do not occur in the case of dehydrogenation according to Arakawa et al. It was therefore not foreseeable whether the inventive Ni(0) complexes with phosphorus-containing ligands are deactivated by these oxygenates. Further, there is no showing or apparent reason, based on the limited disclosure and examples of Fischer et al., that it would be obvious to modify Watson et al. to achieve the claimed invention.

Therefore, the claimed invention is novel and non-obvious in view of the references of record. Accordingly, withdrawal of the rejection is requested.

In the event the Examiner believes an interview might serve in any way to advance the prosecution of this application, the undersigned is available at the telephone number noted below.

The Office is authorized to charge any necessary fees to Deposit Account No. 03-2775.

A fee for a one-month extension of time has been paid with the filing of this response. Applicant believes no additional fee is due with this response. However, if an additional fee is due, please charge our Deposit Account No. 03-2775, under Order No. 12810-00311-US1 from which the undersigned is authorized to draw.

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Respectfully submitted,

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